**Goal**
- Increase driver awareness, convenience, and safety.
- Ticket avoidance system.
- Eliminate road hazards due to human error.

**Motivations and Objectives**

**Motivations**
- There are currently 19 states with “Wipers On/Headlights On” laws that penalize drivers for not activating their headlights with their windshield wipers. Why not automatically turn on both at the same time?
- Speeding was a contributing factor in 31 percent of all fatal crashes, with more than 600 fatalities in 2016 in New Jersey alone.

**Objectives**
- Create a highly power efficient circuit at the transistor and passive component level to automatically control the windshield wipers and headlights based on natural ambient conditions.
- To develop an automated system that will seamlessly alert the driver of unintentional and potentially dangerous excess vehicular speed.

**Development Challenges**

**Head/Tail Light and Windshield Wiper Automation**
- Designing circuitry that could process both DC and AC signals coming from the vehicle’s ECM (Electronic Control Module).
- Ensuring a car battery’s amperage capabilities are regulated safely.
- Correctly determining the output behavior for a rain dependent sensor under highly dynamic precipitation conditions.

**Speed Limit Detection / Vehicular Speed Extraction**
- Computational complexity caused by color segmentation prior to the text recognition stage within MATLAB.
- Communication between MATLAB and Arduino.
- At full stop, speed extraction would result in displaying incorrect values to the driver.

**Methodology / Flowcharts**

**Results**

**Future Development**
- Integrating the automation circuitry with OEM (Original Equipment Manufacturer) wiring.
- Improve accuracy and processing speed of speed limit detection.
- Creating an enclosure for Arduino unit.
- Research more precise approaches to determine the presence or lack of rain.

**References**
